

PCT/EP 03/03052



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Patentanmeldung Nr. PCT/EP 03/03052
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Blatt 2 der Bescheinigung
Sheet 2 of the certificate
Page 2 de l'attestation



Anmeldung Nr.:
Application no.:
Demande n°:

PCT/EP 03/03052

Anmelder:
Applicant(s):
Demandeur(s):

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Titre de l'invention:

A Dental Treatment Composition

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1 A Dental Treatment Composition

2

3 Technical Field

4

5 The invention relates to a dental treatment
6 composition, and a process for complete dental care,
7 including treatment of teeth and gums.

8

9 Background

10

11 A great many toothpaste compositions have been
12 developed and marketed for several years now.

13

14 It is known that toothpaste formulations may contain
15 various components, in particular water, a wetting
16 agent (for example glycerol, sorbitol, xylitol or
17 polyethylene glycol, etc.), a thickener (for
18 example xanthan gum), a source of flouride (usually
19 sodium fluoride or sodium monofluorophosphate (anti-
20 tooth-decay), a colorant, a flavouring, a sweetener,
21 a fragrance, a preserving agent, a surfactant and/or
22 additive, etc.

1
2 They generally also contain an abrasive agent which
3 must, by its mechanical action, remove dental plaque
4 while at the same time not subjecting the teeth
5 themselves to unacceptable abrasion.
6

7 Among the abrasive agents usually employed, mention
8 may be made of sodium bicarbonates and calcium
9 phosphates, sodium metaphosphates, aluminas and, in
10 recent years, silicas.
11

12 However, the agents of the prior art, in particular
13 silica and alumina abrasive agents in toothpaste
14 compositions, are not always of desirable refractive
15 index or porosity.
16

17 It is an object of the invention to overcome at
18 least some of the above disadvantages.
19

20 Statements of Invention

21
22 According to the invention, there is provided a
23 personal care treatment composition which comprises
24 a particulate erasing agent, the particles of the
25 erasing agent being dimensioned to roll along a
26 surface. Ideally, the personal care treatment
27 composition is a dental treatment composition. Other
28 types of personal care treatments include skin
29 exfoliation and personal washing.
30

31 In this specification, the term "particulate erasing
32 agent" should be understood as referring to a
33 multiplicity of relatively soft particles which are

1 dimensioned to be rolled along a surface and which,
2 during such a rolling action, pick up debris,
3 stains, plaque, tartar or the like from the surface,
4 especially dental and gum surfaces, in a manner
5 similar to which an eraser rubs pencil markings off
6 a page. As such, the term preferably excludes
7 abrasive particles.

8
9 In one embodiment of the invention, the dental
10 treatment composition comprises at least 3% water
11 (W/W), generally at least 5% water (W/W).
12

13 Preferably, the particles of the erasing agent
14 comprise a precipitate or agglomerate of an
15 insoluble alkali metal salt. Typically, the salt is
16 a carbonate. Suitably, the alkali earth metal is
17 calcium. Most preferably, the particles of the
18 erasing agent comprise a precipitate or agglomerate
19 of insoluble calcium carbonate.
20

21 Ideally, the particles of the erasing agent are non-
22 crystalline.
23

24 Preferably, the particles are generally round. In
25 this specification the term "generally round" as
26 applied to particles should be understood to mean
27 any shape which of particle which enables the
28 particle to easily assume a rolling motion when
29 moved along a surface. As such, while the term is
30 primarily intended to refer to spherical particles,
31 it is not intended to exclude other types of
32 spheroids such as spheres having an oblong or

1 elliptical shape. Typically, the particles will
2 have an irregular surface configuration.

3
4 Ideally, the particles are relatively soft.
5 Generally, the particles have an average hardness of
6 less than 10 Mohs, typically less than 8 Mohs, and
7 preferably less than 6 Mohs. Typically, the
8 particles will have an average hardness of at least
9 1 Mohs, and preferably of at least 2 Mohs. In a
10 preferred embodiment of the invention, the particles
11 will have an average hardness of about 3 Mohs.
12 Typically, the particles have an average maximum
13 diameter of between 30 and 1000 microns.

14
15 In one embodiment of the invention, the particles
16 have an average maximum diameter of between 30 and
17 1000 microns, preferably between 60 and 120 microns,
18 and most preferably between 70 and 80 microns.

19
20 Typically, the particulate erasing agent comprises
21 between 3 and 75 % of the total composition (W/W).

22
23 In one embodiment of the invention, the dental
24 treatment composition comprises a paste or a gel.
25 Preferably, the dental treatment composition is a
26 toothpaste. Alternatively, the dental treatment
27 composition may comprise a teeth whitening
28 composition, a plaque removal composition, a
29 toothgel, a polishing paste, or the like.

30
31 In one embodiment of the invention, the dental
32 treatment composition comprises a powder which,

1 optionally, is used as an additive in a further
2 component or components.

3

4 The invention also relates to the combination of a
5 dental treatment composition according to the
6 invention contained within a dispenser for the
7 composition. Typically, the dispenser comprises a
8 deformable tube. Other types of dental care
9 composition dispensers are also envisaged.

10

11 The invention also relates to a particulate erasing
12 agent comprising particles which are dimensioned to
13 roll along a surface, for use in a dental treatment
14 composition.

15

16 Suitably, the particles of the erasing agent
17 comprise a precipitate or agglomerate of an
18 insoluble alkali metal salt, such as calcium
19 carbonate. Ideally, the dental treatment composition
20 is a toothpaste or a toothgel. Preferably, the
21 particles of the erasing agent are non-crystalline.

22

23 The invention also relates to a method of treating
24 teeth comprising the steps of:

- 25 - applying a suitable amount of a dental
26 treatment composition according to the
27 invention onto a suitable applicator for the
28 composition;
29 - using the applicator to rub the composition
30 onto a surface of the teeth such that at
31 least some of the particles of the erasing

1 agent roll along at least a portion of the
2 teeth; and
3 - rinsing the composition off the teeth.
4

5 Typically, the applicator is a toothbrush,
6 interdental brush, or soft rubber cup. When the
7 applicator is a brush, it may be manually,
8 mechanically or electrically operated.
9

10 The invention also relates to the use of the process
11 of the invention in dental applications such as
12 teeth whitening, plaque and tartar removal and
13 general cleaning or polishing of the teeth, gums and
14 mucous membranes of the buccal cavity, and
15 prosthetic parts such as crowns, bridges and
16 complete or partial dentures. As such, the process
17 may involve either blast application using some form
18 of particle accelerator, or manual application, of
19 the treating agent. Manual application includes
20 conventional brushing, rubbing, polishing or the
21 like.
22

23 The invention also relates to the use of the process
24 of the invention in treating bone or in skin
25 exfoliation treatment.
26

27 Brief Description of the Drawings 28

29 The invention will be more clearly understood from
30 the following description of some embodiments
31 thereof, given by way of example only, with
32 reference to the following figures in which:

1
2. Fig 1. is an illustration of a particle of a treating
3 agent according to the invention; and
4

5 Fig 2 illustrates the process of the invention.
6
7

8 Detailed Description
9

10 Referring to the drawings, and initially to Fig 1,
11 there is illustrated a particle, indicated generally
12 by the reference numeral 1, which is used in the
13 process of the invention. The particle is a
14 particle of precipitated calcium carbonate and has a
15 generally round, and slightly irregular, shape and a
16 rough, irregular, surface configuration.
17

18 Referring to Fig 2, the process of the invention is
19 illustrated in which the particle 1 is rubbed along
20 a surface 2 of a tooth having a coating 3 of plaque
21 to be removed. Due to the nature and the round
22 shape of the particle 1, upon impact the particle 1
23 rolls along the surface, rubbing the surface and
24 absorbing the coating 3 onto a surface of the
25 particle. This has the net effect of removing the
26 coating from the surface without causing any damage
27 to the surface.
28

29 Example 1
30

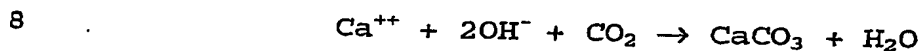
31 Method of production of particulate erasing agent.
32

1 Production of insoluble calcium carbonate particles
2 is carried out by providing free Ca^{++} in a liquid
3 with a PH over 7 by dissolving calcium oxide in
4 water.

5

6 Addition of CO_2 results in the precipitation CaCO_3 .

7



9

10 Various other methods of production of particles
11 forming part of treating agents according to the
12 invention have been investigated using various types
13 of substrates including plastic, metal and polymer.
14 Examples of these methods include:

15

16 Chemical

17

18 There are numerous chemical methods for producing
19 particulate erasing agents. Generally, chemical
20 methods result in very fine powder particle sizes.

21 Such methods include Sol Gel, chemical

22 precipitation, Reaction, reduction (hydrogen in an
23 autoclave to reduce metal salts to the metal),

24 decomposition (eg metal-carbonyls) and Electrolysis.

25

26 Spray drying

27

28 This is the most widely used industrial process
29 involving particle formation and drying. It is
30 highly suited for the continuous production of dry
31 solids in either powder, granulate or agglomerate

1 form from liquid feedstocks as solutions, emulsions
2 and pumpable suspensions.

3
4 Agglomeration

5

6 The most common method of agglomeration is where the
7 constituents are physically mixed together with an
8 organic binder. The solvent is then driven off and
9 the resultant material sized. The binder should be
10 burnt off during spraying. This process is used in
11 the manufacture of NiAl, AlSi or polyester powders.

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13 constituents are physically mixed together with an
14 organic binder. The solvent is then driven off and
15 the resultant material sized. The binder should be
16 burnt off during spraying. This process is used in
17 the manufacture of NiAl, AlSi-polyester powders.

18 The use of spray drying has become another common
19 method for the agglomeration of powders. Here, a
20 slurry is formed with the constituents and this is
21 then fed into a rotary spray head. Here, the slurry
22 forms an atomised cloud which is solidified by an
23 opposing warm air stream to produce a powder. This
24 method is used for ceramics such as zirconia and
25 cermets such as WC-cobalt. The powder is largely
26 spherical but in the as spray dried state can be
27 porous and friable. The material is often densified
28 and stabilised by sintering and/or spray
29 densification.

30

31 There are also methods of mechanical agglomeration
32 (eg the Hosakawa method) where for example a hard

1 constituent is mechanically driven into a softer
2 matrix particle to form a composite powder. Indeed,
3 simple ball grinding can be used to mechanically
4 alloy two or more constituents together.
5 Although sintering can be used as part of the spray
6 drying process it can also be used alone as a method
7 to manufacture powders. The constituents are mixed
8 together and heated to get some solid state
9 diffusion going and then the resultant product is
10 crushed. A number of repeated cycles can be used to
11 promote further alloying in which case the powder is
12 called a "reacted" powder.
13

14 Atomisation

15 There are a number of atomisation techniques which
16 all rely on the production of a molten pool as the
17 source. Atomisation methods include Rotating
18 Electrode, Vibrating Electrode (arc), Centrifugal
19 (from a melt) and Rapid Solidification (eg aluminium
20 ribbon). However, by far the most commonly used
21 methods are either water or gas atomisation.
22

23 Others

- 24 - Solid State Reduction
- 25 - Electrolysis
- 26 - Electrodeposition
- 27 - Mechanical Comminution
- 28

29 Toothpaste Compositions

30

11

1 As described above, the dental treatment composition
2 of the invention may take the form of a toothpaste.
3 In this regard, particulate erasing agent
4 (precipitated calcium carbonate as formed in Example
5 2) may be added to a toothpaste composition in an
6 amount of 20 % of the toothpaste composition (w/w).
7 Prior to addition of the erasing agent it is sized
8 using vibrating sieves to ensure that the particles
9 have an average diameter of between 70 and 80
10 microns. Other suitable sizing methods will be
11 apparent to those skilled in the art. Details of
12 toothpaste formulations will be well known to those
13 skilled in the field dental treatment compositions
14 and will not be described in any detail in this
15 specification.

16

17 Personal Wash Compositions

18

19 The particulate erasing agent as produced in Example
20 3 (precipitated calcium carbonate) may be used in
21 the formulation of personal wash compositions such
22 as, for example, soap, shower gel, body wash, and
23 the like. The amount of particulate erasing agent
24 added to the compositions can be varied depending on
25 the type of product. Otherwise, the composition of
26 such personal wash composition will be known to
27 those skilled in the field of personal wash
28 formulation.

29

30

31 The invention is not limited to the embodiments
32 hereinbefore described which may be varied in both

12

1 construction and process step without departing from
2 the invention.

3

4

5

6

1 Claims

2

3 1. A dental treatment composition which comprises a
4 particulate erasing agent, the particles of the
5 erasing agent being dimensioned to roll along a
6 surface.

7

8 2. A dental treatment composition as claimed in
9 Claim 1 having at least 3% water (W/W).

10

11 3. A dental treatment composition as claimed in
12 Claim 1 or 2 in which the particles of the
13 erasing agent comprise a precipitate or
14 agglomerate of an insoluble alkali metal
15 carbonate.

16

17 4. A dental treatment composition as claimed in
18 Claim 3 in which the particles of the erasing
19 agent comprise a precipitate or agglomerate of
20 insoluble calcium carbonate.

21

22 5. A dental treatment composition as claimed in any
23 preceding Claim wherein the particles of the
24 erasing agent are non-crystalline.

25

26 6. A dental treatment composition as claimed in any
27 preceding claim in which the particles have an
28 average hardness of between 1 and 10 Mohs.

29

30 7. A dental treatment composition as claimed in
31 Claim 6 in which the particles have a hardness
32 of between 2 and 4 Mohs.

- 1
- 2 8. A dental treatment composition as claimed in any
- 3 preceding claim in which the particles have an
- 4 average maximum diameter of between 30 and 1000
- 5 microns.
- 6
- 7 9. A dental treatment composition as claimed in any
- 8 preceding claim in which the particles are
- 9 generally round.
- 10
- 11 10. A dental treatment composition in which the
- 12 particulate erasing agent comprises between 3
- 13 and 75 % of the total composition (W/W).
- 14
- 15 11. A dental treatment composition as claimed in any
- 16 preceding claim in the form of a paste, gel or
- 17 powder.
- 18
- 19 12. A dental treatment composition as claimed in
- 20 Claim 11 which is a toothpaste, a toothgel, a
- 21 polishing paste or a powder additive.
- 22
- 23 13. In combination, a dental treatment composition
- 24 according to any of Claims 1 to 12, contained
- 25 within a dispenser for the composition.
- 26
- 27 14. The combination of Claim 13 in which the
- 28 dispenser comprises a deformable tube.
- 29
- 30 15. A particulate erasing agent comprising particles
- 31 which are dimensioned to roll along a surface,
- 32 for use in a dental treatment composition.

- 1
2 16. The use of Claim 15 wherein the particles of the
3 erasing agent comprise a precipitate or
4 agglomerate of an insoluble alkali metal
5 carbonate such as calcium carbonate.
6
7 17. The use of Claims 15 or 16 in which the dental
8 treatment composition is a toothpaste, a
9 toothgel, a polishing paste or a powder
10 additive.
11
12 18. The use of any of Claims 15 to 17 wherein the
13 particles of the erasing agent are non-
14 crystalline.
15
16 19. A method of treating teeth comprising the steps
17 of:
18 - applying a suitable amount of a dental
19 treatment composition of any of Claims 1 to
20 12 onto a suitable applicator for the
21 composition;
22 - using the applicator to rub the composition
23 onto a surface of the teeth such that at
24 least some of the particles of the erasing
25 agent roll along at least a portion of the
26 teeth; and
27 - rinsing the composition off the teeth.
28
29 20. A method according to Claim 19 in which the
30 applicator is a toothbrush, an interdental
31 toothbrush, or a soft rubber cup.
32

1. Abstract

2
3. A dental treatment composition comprises a
4 particulate erasing agent having particles which are
5 dimensions to roll along a surface. The composition
6 has at least 3% water and the particulate erasing
7 agent comprises a precipitate or agglomerate of an
8 insoluble alkali metal carbonate. The composition
9 may be a toothpaste, a toothgel, a polishing paste
10 or an additive powder. A method of treating teeth
11 to remove dirt, debris, stains or the like which
12 employs a composition according to the invention is
13 also described.

1 / 1

Fig. 1

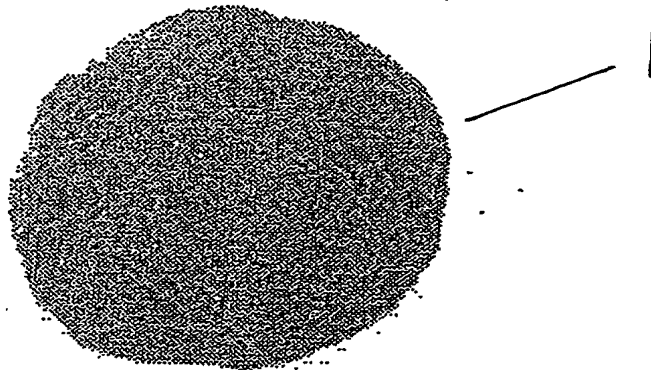
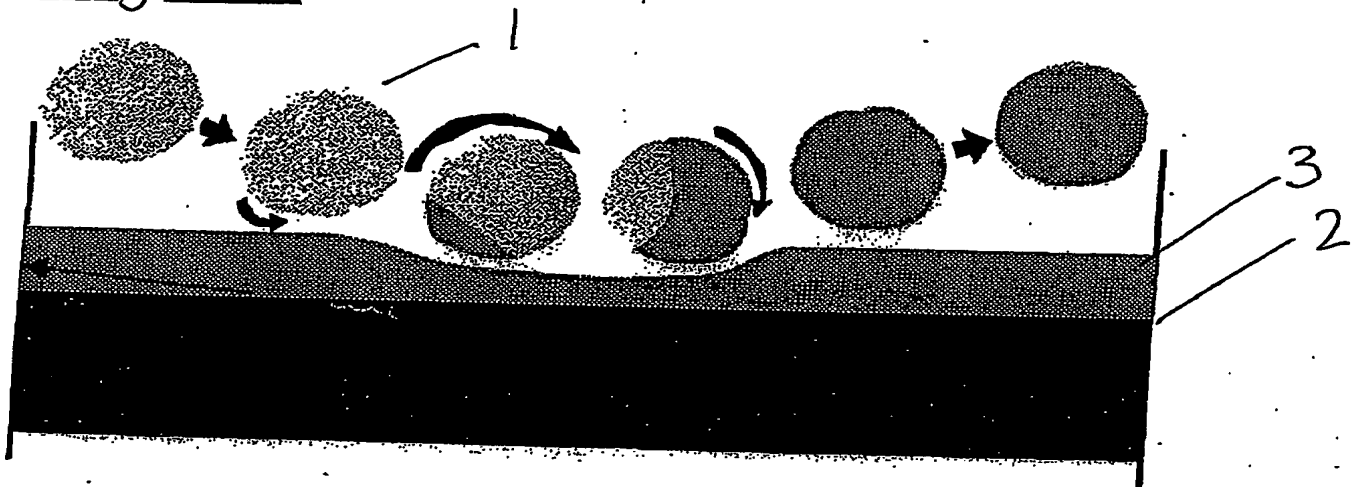


Fig. 2



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